3. Candela

Program Name: Candela.java **Input File: candela.dat**

Candela's teacher, who gives very difficult tests, has announced one for next week, and has provided her class some preview information about the questions that will be on the test so that she and her classmates can strategize about how best to approach it. The information provided by the teacher only includes the question number, how difficult the question will be on a scale of 1 to 10, and how many points it will be worth if it is answered correctly, on a scale of 1 to 20. The worth of each question does not necessarily match its difficulty, so it is possible that an easy question will be worth as much if not more than a difficult question. The total number of points available will exceed the maximum score of 100 that will be awarded, so students do not have to answer every question, and will be awarded a score of 100 if they meet it exactly, or even exceed it.

What Candela and her classmates have done in the past is figured out the level of difficulty they think they can handle, based on previous efforts, and then strategize to only answer the questions that approach or meet that effort, hoping for a good score because of their work.

For example, on the last test there were 10 questions with the following point and difficulty levels:

- Q#1: 12 points, difficulty level 8
- Q#2: 10 points, difficulty level 5
- Q#3: 8 points, difficulty level 3
- Q#4: 12 points, difficulty level 4
- Q#5: 7 points, difficulty level 5
- Q#6: 13 points, difficulty level 3
- Q#7: 16 points, difficulty level 2
- Q#8: 2 points, difficulty level 8
- Q#9: 14 points, difficulty level 4
- Q#10: 4 points, difficulty level 5

Being very conscientious about their grades, Candela and her friends decide to figure out the best approach to maximize their efforts in getting a decent grade without exceeding their target difficulty level. The teacher will allow students to bring with them the information provided, along with any strategies for which questions to attempt to maximize their test score.

For the last test, the result for Candela was a score of 96, which she was able to achieve by answering all but question #8, for a total of 96 points and an accumulated difficulty level of 39. She will shoot for a 40 level of difficulty for the text next week. Carla, on the other hand had earned a test score of 85 with a combined difficulty level of 29, and therefore thinks 30 is a reasonable difficulty number for her to attempt.

Input and output descriptions and samples on next page.

(Candela – cont.)

Input: The data file will contain an initial integer Q (10 <= Q <= 30), indicating Q questions to follow. Each question data set consists of two values, an integer P representing the number of points that question is worth, an integer D indicating the difficulty level of the question. The first question is Question #1, the second is Question #2, continuing in that sequence, with the last one as Question #Q. Following the list of questions, several integers T will follow, each on one line and each representing a target difficulty level indicated by a student. There will be only one set of questions to process, but several target values after the question listing.

Output: For each data set, list the target difficulty designated, the calculated difficulty expected, the total score of the questions the student has selected to attempt and hopes to achieve, and each question on the calculated list, shown with the points and difficulty level, exactly as displayed, formatted and aligned in the examples below. Print a final "**=====**" line below each complete output.

Sample input:

```
10
12 8
10 5
8 3
12 4
7 5
13 3
16 2
2 8
14 4
4 5
40
30
10
```

Sample output:

```
Target diff     = 40
Calculated diff = 39
Expected points = 96
Q# 1, 12 pts, diff 8
Q# 2, 10 pts, diff 5
Q# 3,  8 pts, diff 3
Q# 4, 12 pts, diff 4
Q# 5,  7 pts, diff 5
Q# 6, 13 pts, diff 3
Q# 7, 16 pts, diff 2
Q# 9, 14 pts, diff 4
Q#10,  4 pts, diff 5
=====
Target diff     = 30
Calculated diff = 29
Expected points = 85
Q# 1, 12 pts, diff 8
Q# 2, 10 pts, diff 5
Q# 3,  8 pts, diff 3
Q# 4, 12 pts, diff 4
Q# 6, 13 pts, diff 3
Q# 7, 16 pts, diff 2
Q# 9, 14 pts, diff 4
=====
Target diff     = 10
Calculated diff = 9
Expected points = 43
Q# 6, 13 pts, diff 3
Q# 7, 16 pts, diff 2
Q# 9, 14 pts, diff 4
=====
```